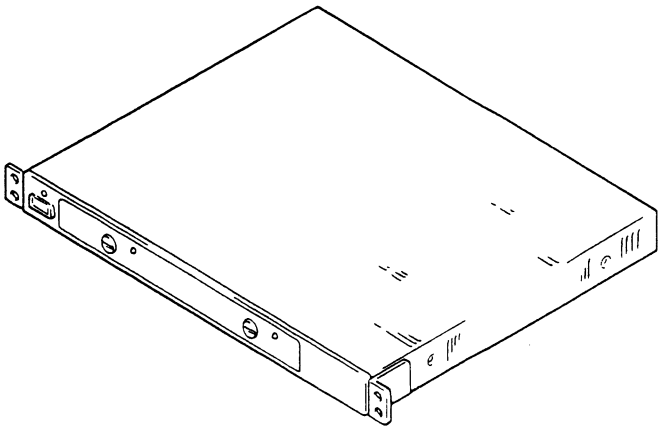
SRP-P2070

SERVICE MANUAL

AEP Model
E Model



SPECIFICATIONS

Channel: 2 channels
Input sensitivity: 0dBs/–10dBs selectable, (50 W + 50 W/8 Ω load impedance)

Input	Balanced	Unbalanced
Input circuit	Electric balanced circuit	—
Input impedance	More than 20 kΩ	
Input connector and jack	XLR-3-31 type	Phono jack

Item	Stereo	Monaural
Output terminal	Screw type binding terminal	
Rated output	70 W + 70 W (20—20,000 Hz, 0.1%, 4 Ω) 50 W + 50 W (20—20,000 Hz, 0.05%, 8 Ω)	150 W (20—20,000 Hz, 0.1%, 8 Ω)
Frequency response	20—20,000 Hz within $^{+0\ dB}_{-0.5\ dB}$	
Damping factor	More than 100 (8 Ω, 1 kHz)	—
Channel separation	More than 70 dB (1 kHz: 8 Ω load, at 50 W output)	—
Residual noise (IHF-A, input terminated, 0dBs position)	Less than 120 μV	Less than 240 μV

0 dBs=0.775 V

Functions
- CLIP indicators (light with T.H.D 1%)
- Protection circuits (level 1, automatic-reset type)
  DC protection (The pilot lamp lights in red.)
  Termination protection (The pilot lamp lights in red.)
  Heat sink over heat protection (The pilot lamp lights in red.)
- Protection circuits (level 2)
  Transformer over heat protection (The pilot lamp goes off.)
- 21-point level control
- STEREO/MONO selector switch
- BAL/UNBAL selector switch
- LEVEL selector switch

Power requirement: 120 V AC, 50/60 Hz
230 V AC, 50/60 Hz
Power consumption: 160 W
Dimensions: 482 x 44 x 350 mm (w/h/d) (19 x 1 3/4 x 13 7/8 inches) not incl. projecting parts
Mass: 8 kg (17 lb 7 oz)
Accessory supplied: AC power cord (1)

Design and specifications are subject to change without notice.

STEREO CASSETTE DECK

SONY®

SECTION 1
ADJUSTMENTS

1. Tools

Measure : Digital volt meter
Tool : +Screwdriver

2. Adjustment procedure

※ ( ) indicates the adjustment part of CH2 side.

1) Connect +terminal of the digital volt meter to TP101 (201) and − terminal to TP102 (202) and adjust RV101 (201) so that it should be approx. 50 mV.
2) Adjust RV102 (202) so that the voltage between + terminal and − terminal of the speaker output terminal should be close to 0 V.

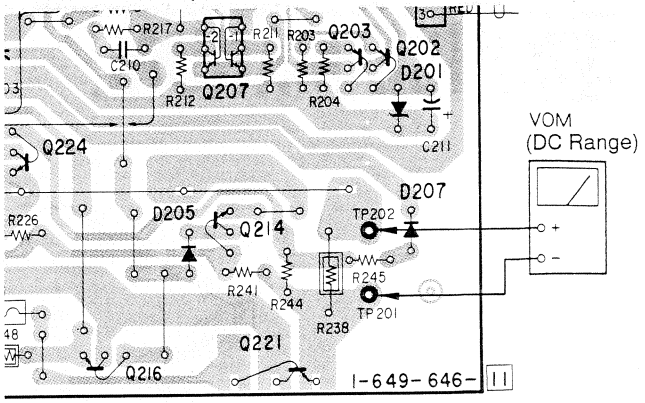
Specification : below ± 25 mV

3) Confirm that the voltage between +terminal and + terminal of the L/R speaker output terminal is below 40 mV.
4) Adjust RV101 (201) so that the voltage between TP101 (201)/102 (202)should be 11 mV.

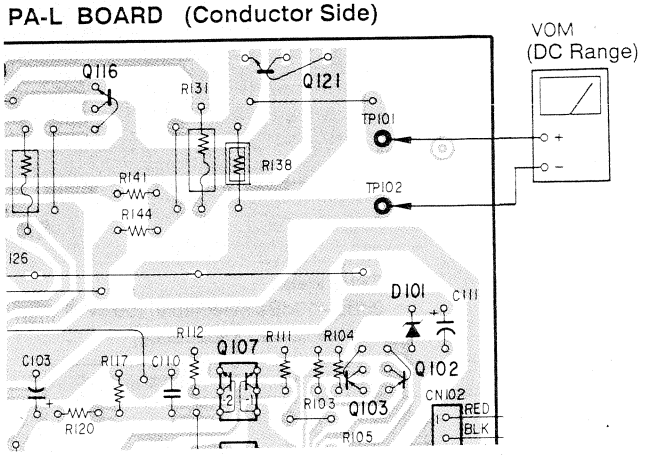
Specification : 11 ± 1 mV

5) Perform the adjustment for CH2 as the procedure step 1 to 4.

PA-R BOARD (Conductor Side)

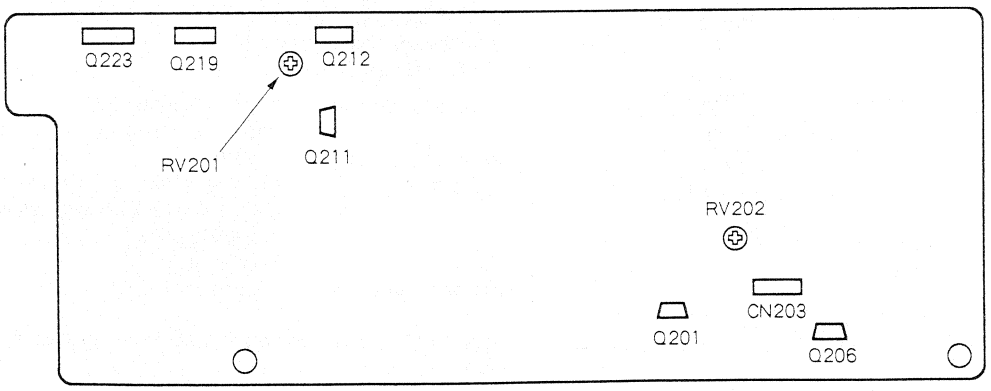


PA-L BOARD (Conductor Side)

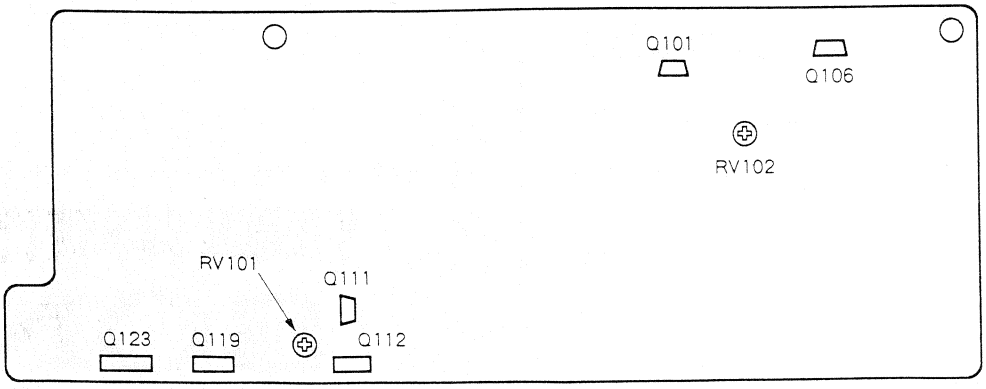


3. Adjustment location diagram

PA-R BOARD (Component Side)



PA-L BOARD (Component Side)



SECTION 2
TROUBLESHOOTING

This unit is equipped with 2-level protection and operates shows as follows to deal with the problems as the table shows.

Level 1 (Normal protection)

Symptoms	Presumed cause	Repair
• The pilot lamp lights inred with broken sound.	DC off set exceeds ± 3 V	• Repair due to the mount breakdown of PA_L/PA_R.
	Temperature of the heat sink is too high	• Leave the power supply off. Radiate heat better.
• The pilot lamp blinks inred (irregularly) with broken sound. One channel is possibly OK.	Output short out or overload (Too much PARA connection)	• Set it should be proper load. Remove short-out.

Level 2 (Trans protection)

In many cases, the protection of level 1 works effectively. However, thermoprotctor (return type, located in transformer) may work when the condition before the protection circuit of level 1 lasts for long time.

Symptoms	Presumed cause	Repair
• The pilot lamp goes off with broken sound. It does not resume even if the power supply is on.	Long term overload.	Radiate heat for 10 to 30 minutes to power supply on.

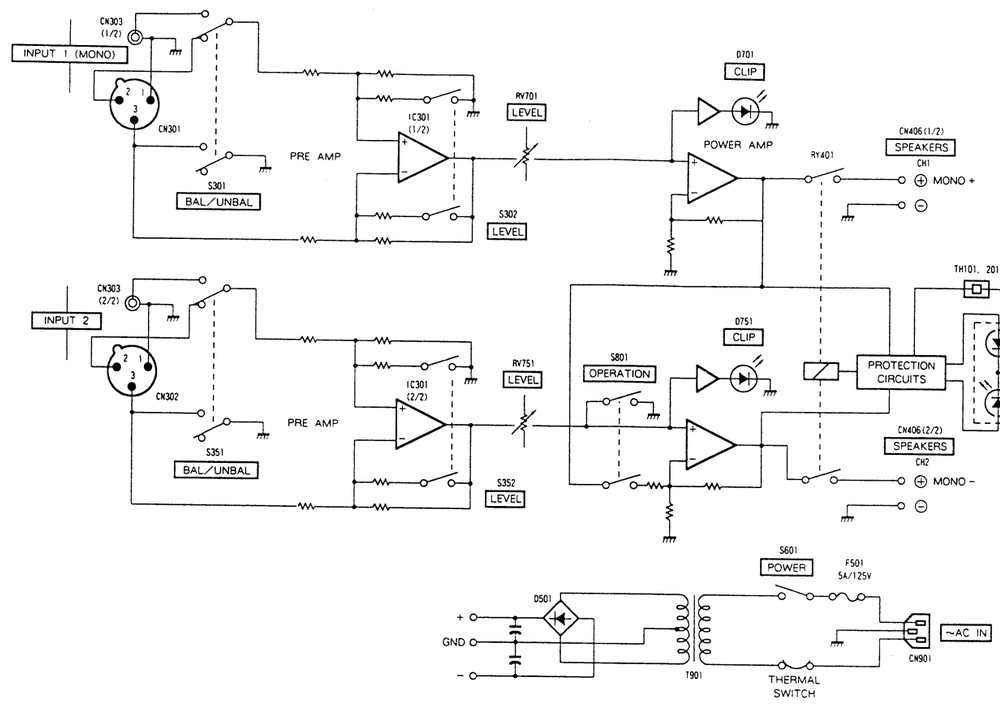
- The temperature of the heat sink and transformer is guaranteed for the range that the CLIP lamp stays off.
- This unit requires at least 1U of the space for the radiation heat of its upper and lower portion. And it also requires forcible air-cooled fan in the condition that the back door of the rack is closed.
- When a limiter/compressor are connected in front of this unit due to the system, it possibly happens that the average signal power becomes much bigger than the normal music signal to cause overheat.
  In this case, set the limit controller shallow to adjust the level.
- When the temperature of the heat sink rises abnormally, check the looseness of the attached screw of temperature correction transister Q112/212.

* Pay attention that the bottom part of this unit (especially srews) is quite hot in normal operation.

SECTION 3
DIAGRAMS

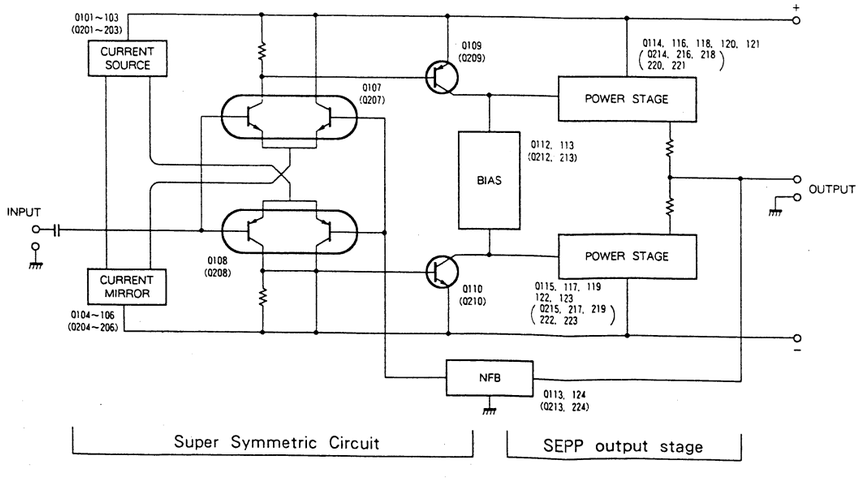
BLOCK DIAGRAM

WHOLE BLOCK DIAGRAM



POWER AMP BLOCK DIAGRAM

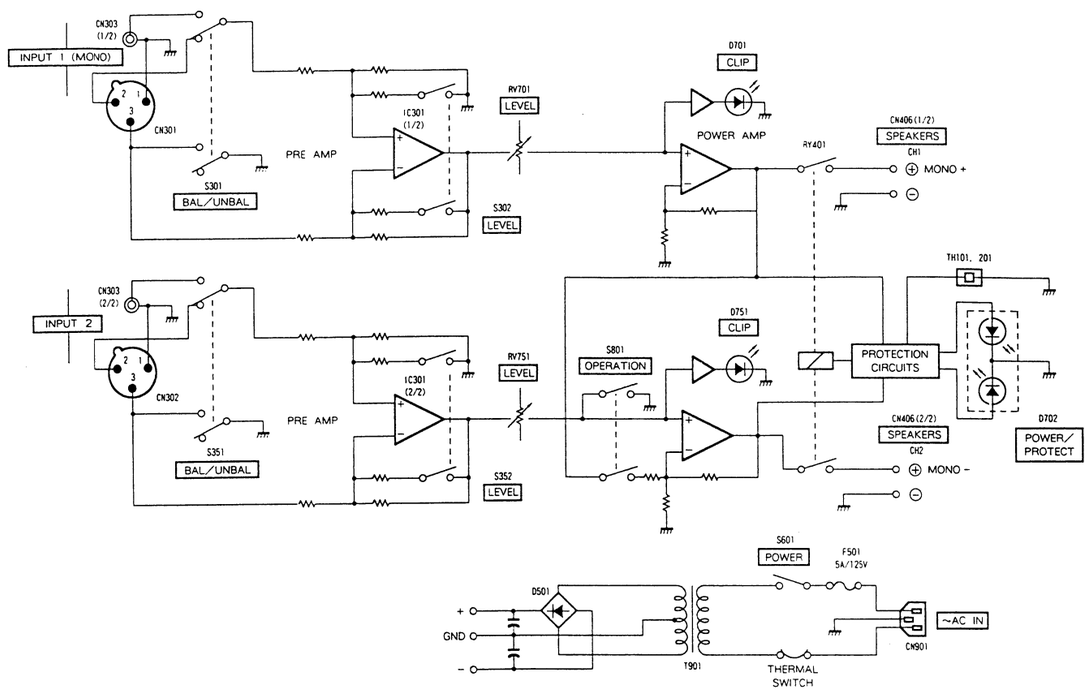
※ The parenthesized Ref No. is the one of CH2 side.



SECTION 3
DIAGRAMS

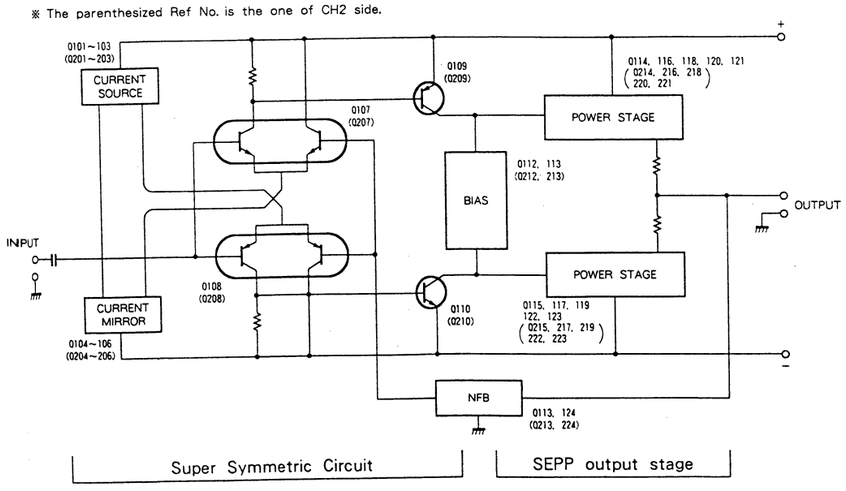
BLOCK DIAGRAM

WHOLE BLOCK DIAGRAM



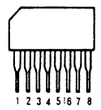
POWER AMP BLOCK DIAGRAM

※ The parenthesized Ref No. is the one of CH2 side.

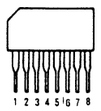


• Semiconductor Lead Layouts

M5220L

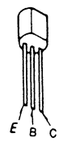


μPC1237HA

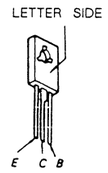


2SA992-FA
2SC2362K-G

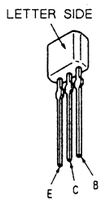
2SA1016KFG



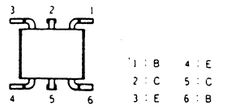
2SA1142-P
2SC2682-P



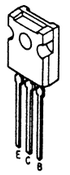
2SA1175-HFE
2SC403SP-51



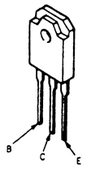
2SA1237
2SC3064



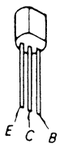
2SA1358-Y
2SC3421-Y
2SC3423-O



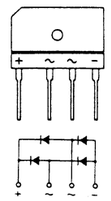
2SA1491-Y
2SC3855-Y



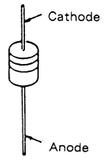
2SC1845-FA



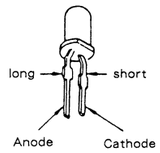
RBV-1506



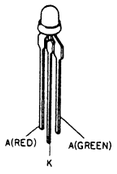
RD22ES-B2
RD6.8ES-B2
1SS202-1



TLR124



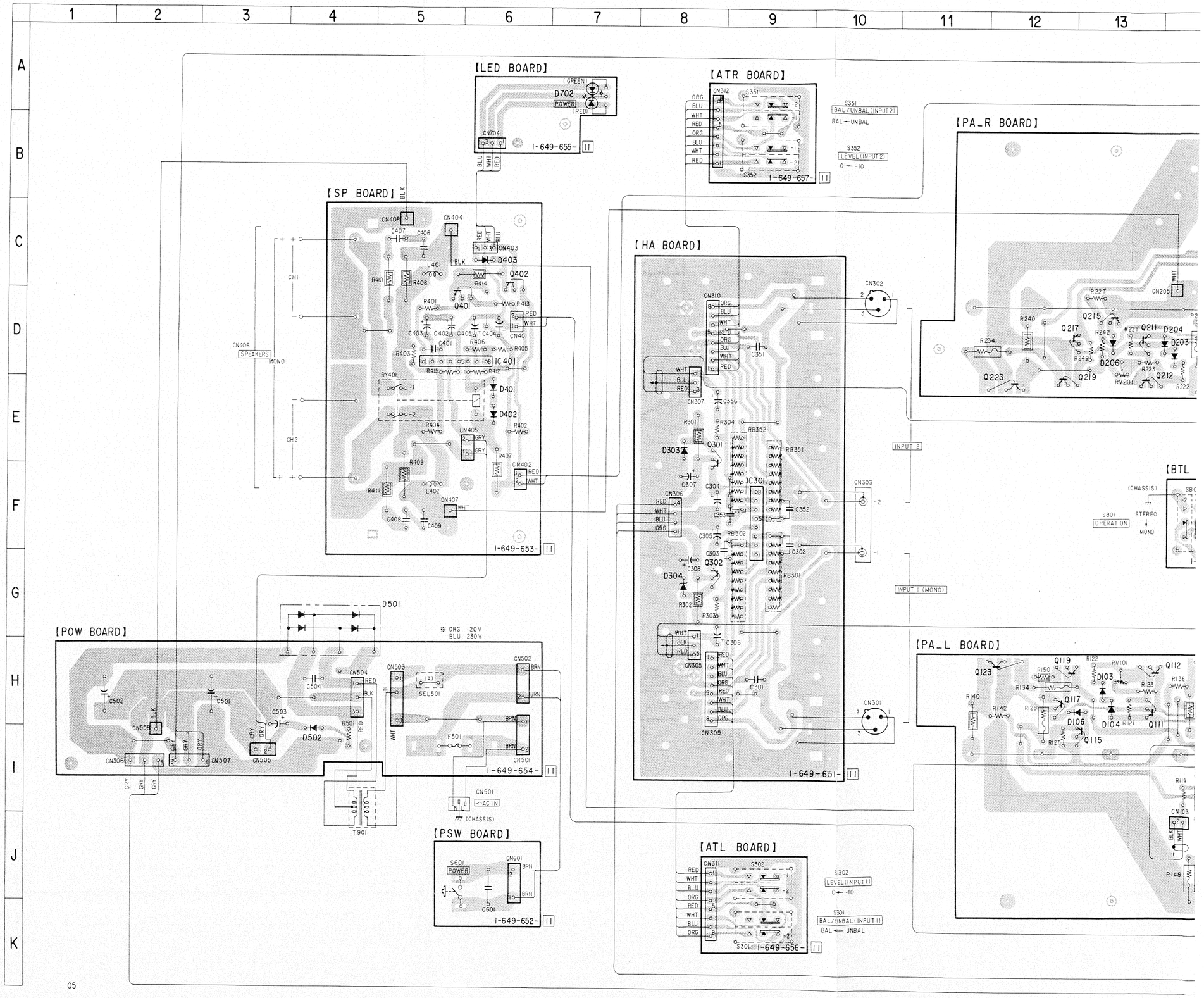
TLSG126



• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D101	I-20	Q112	H-14
D102	J-19	Q113	H-15
D103	H-13	Q114	H-17
D104	H-13	Q115	I-13
D105	H-17	Q116	H-18
D106	H-13	Q117	H-12
D107	I-17	Q118	H-16
D108	J-19	Q119	H-12
D201	C-20	Q120	H-16
D202	B-19	Q121	H-19
D203	D-14	Q122	H-14
D204	D-14	Q123	H-12
D205	D-19	Q124	I-17
D206	D-13	Q201	B-17
D207	D-20	Q202	C-20
D208	B-18	Q203	C-19
D303	E-8	Q204	B-19
D304	G-8	Q205	B-19
D401	E-6	Q206	B-18
D402	E-6	Q207	C-19
D403	C-6	Q208	B-19
D501	G-5	Q209	C-16
D502	I-4	Q210	B-16
D701	K-18	Q211	D-13
D702	A-7	Q212	D-13
D751	A-18	Q213	D-16
		Q214	D-19
IC301	F-9	Q215	D-13
IC401	D-6	Q216	E-18
		Q217	D-12
Q101	J-17	Q218	D-17
Q102	I-20	Q219	D-13
Q103	I-19	Q220	D-16
Q104	J-19	Q221	D-19
Q105	J-19	Q222	D-14
Q106	J-18	Q223	D-12
Q107	I-19	Q224	C-18
Q108	J-19	Q301	E-8
Q109	J-16	Q302	G-8
Q110	J-16	Q401	D-5
Q111	H-13	Q402	C-6

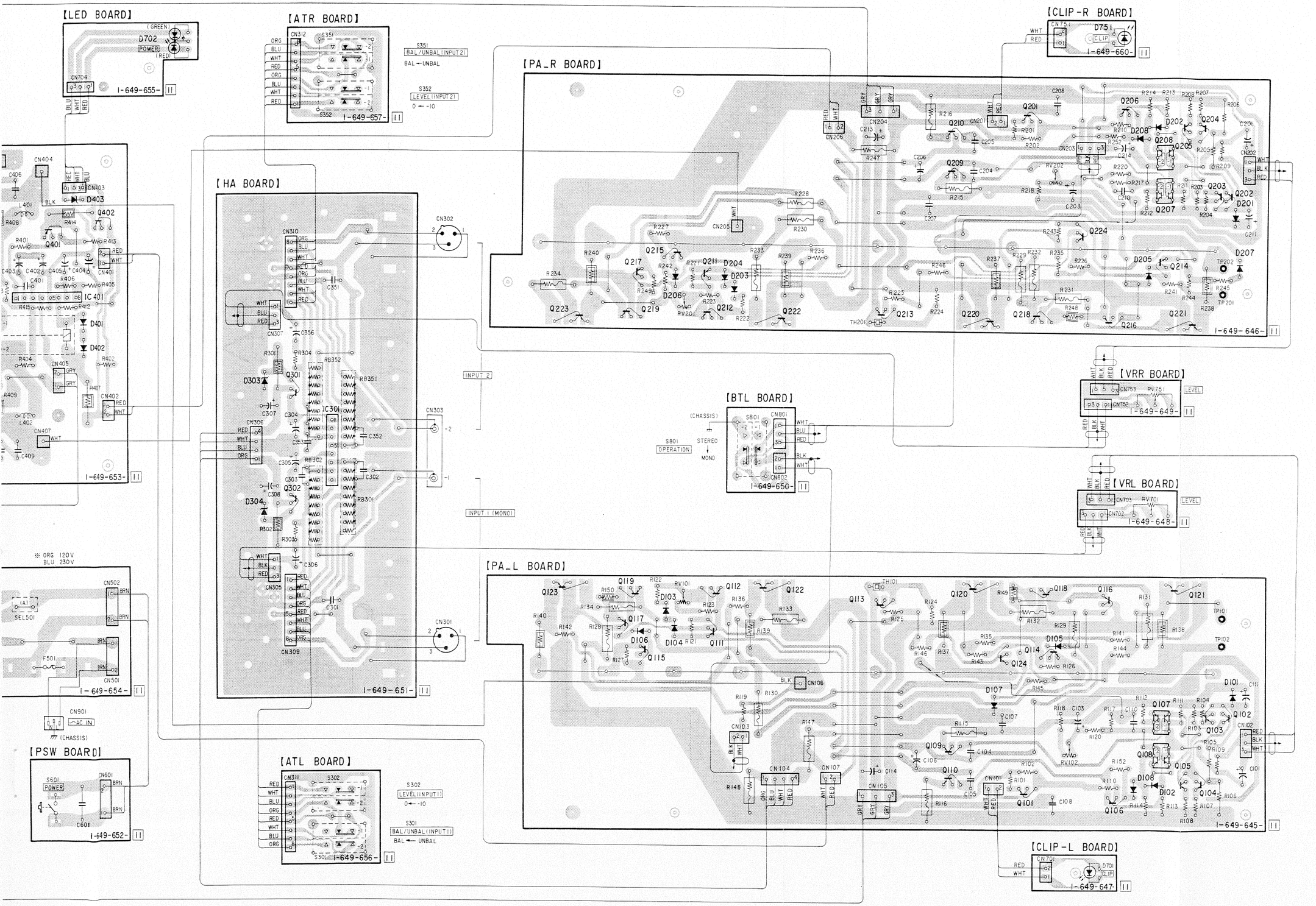
Note:
- ○—— : parts extracted from the component side.
- ▒▒▒ : Pattern of the rear side.

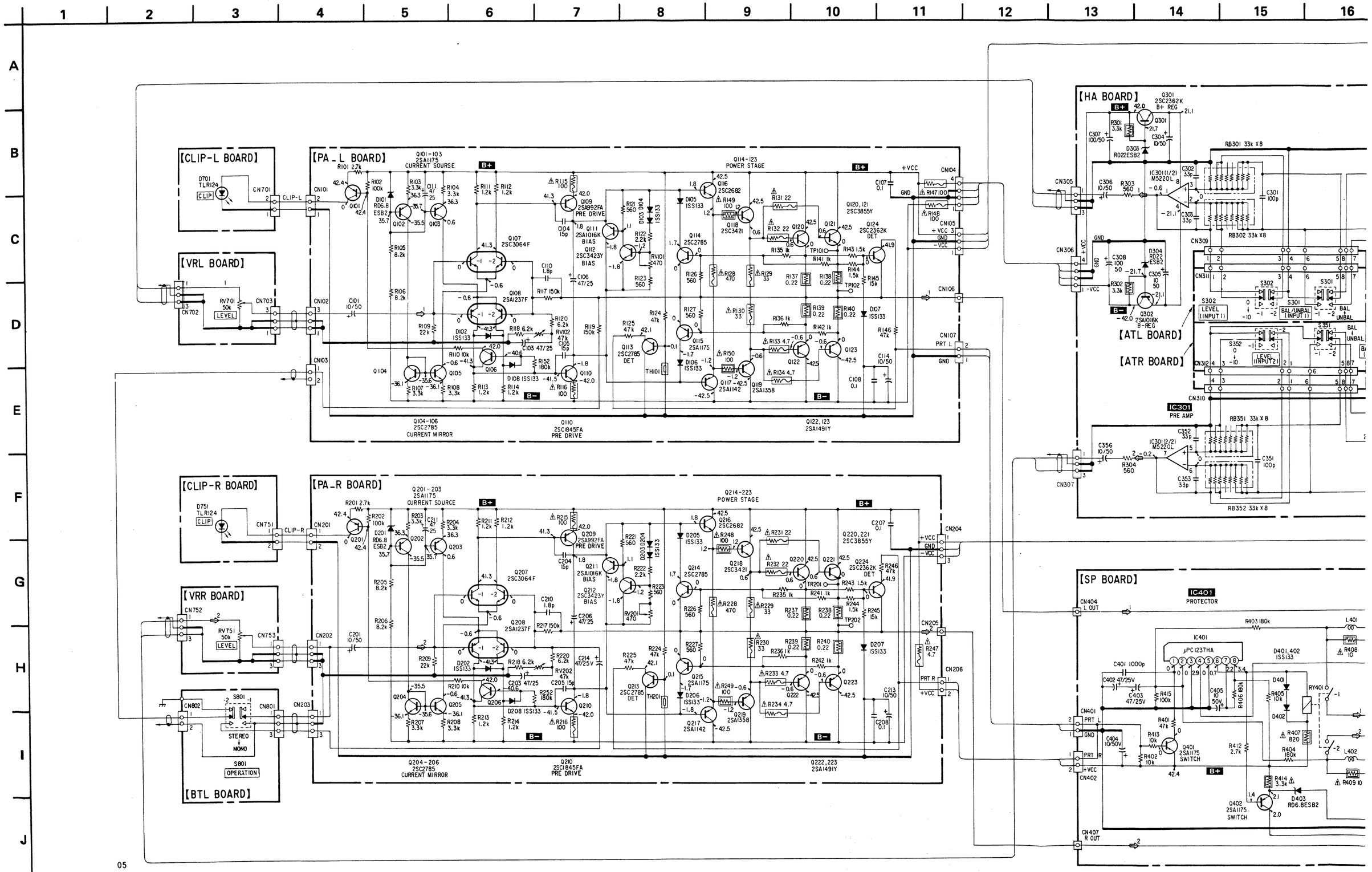


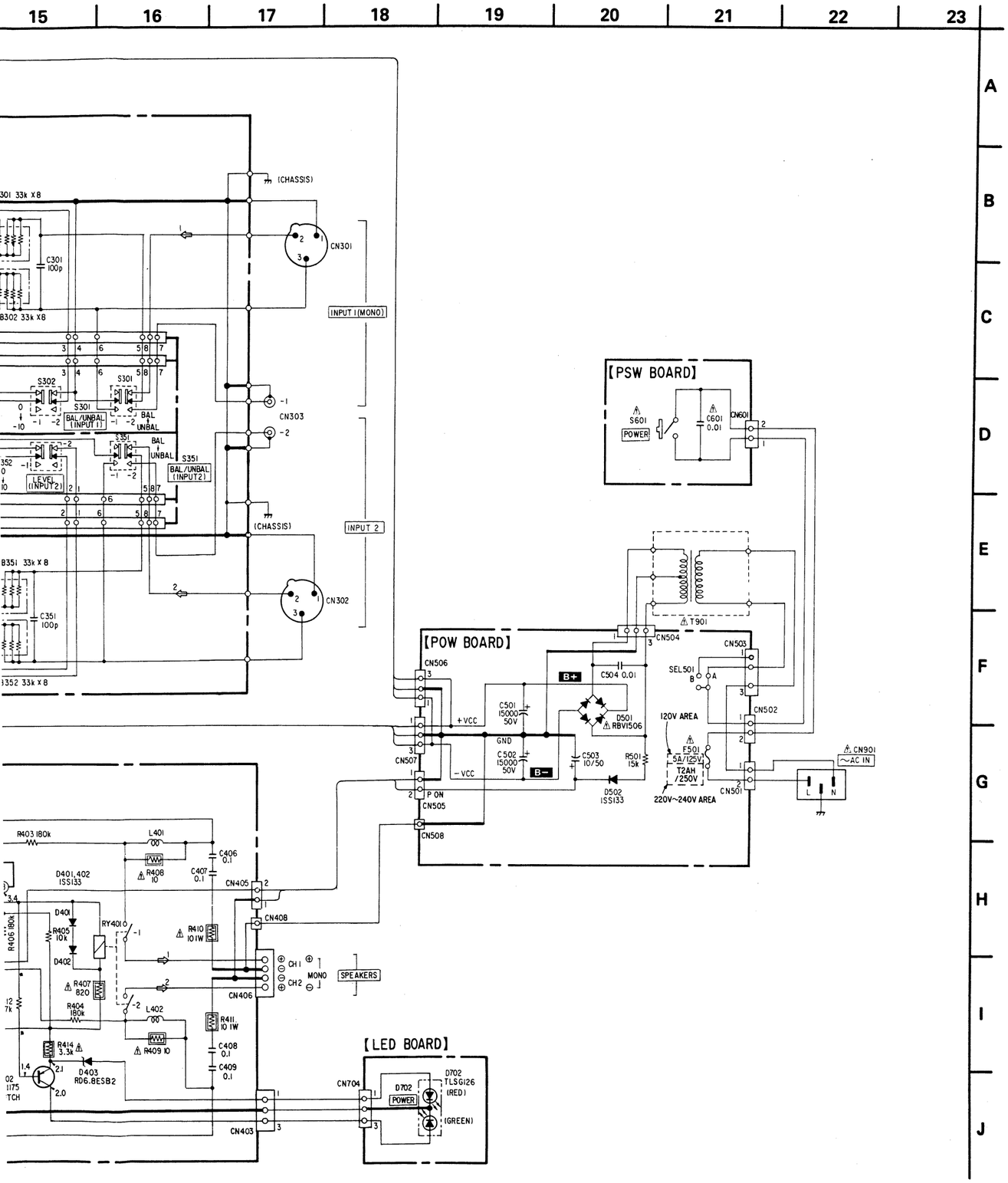
05

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

【LED BOARD】
【ATR BOARD】
【CLIP-R BOARD】
【PA_R BOARD】
【HA BOARD】
【BTL BOARD】
【VRR BOARD】
【VRL BOARD】
【PA_L BOARD】
【PSW BOARD】
【ATL BOARD】
【CLIP-L BOARD】

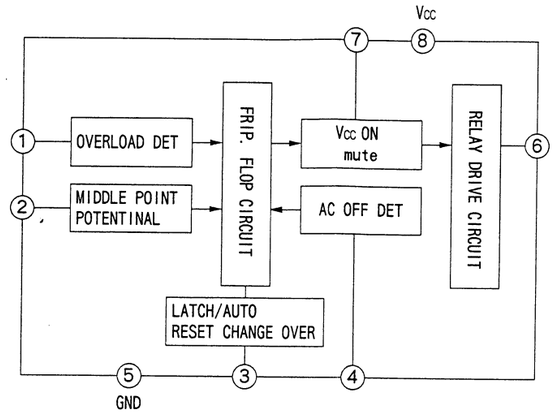



【CLIP-L BOARD】
【VRL BOARD】
【PA_L BOARD】
【CLIP-R BOARD】
【VRR BOARD】
【PA_R BOARD】
【BTL BOARD】
【HA BOARD】
【ATL BOARD】
【ATR BOARD】
【SP BOARD】
Q101-103 2SA1175 CURRENT SOURSE
Q104-106 2SC2785 CURRENT MIRROR
Q107 2SC3064F
Q108 2SA1237F
Q109 2SA992FA PRE DRIVE
Q110 2SC1845FA PRE DRIVE
Q111 2SA1016K BIAS
Q112 2SC3423Y BIAS
Q114-123 POWER STAGE
Q116 2SC2682
Q117 2SA1142
Q118 2SC3421
Q119 2SA1358
Q120,121 2SC3855Y
Q122,123 2SA1491Y
Q124 2SC2362K DET
Q201-203 2SA1175 CURRENT SOURCE
Q204-206 2SC2785 CURRENT MIRROR
Q207 2SC3064F
Q208 2SA1237F
Q209 2SA992FA PRE DRIVE
Q210 2SC1845FA PRE DRIVE
Q211 2SA1016K BIAS
Q212 2SC3423Y BIAS
Q214-223 POWER STAGE
Q216 2SC2682
Q217 2SA1142
Q218 2SC3421
Q219 2SA1358
Q220,221 2SC3855Y
Q222,223 2SA1491Y
Q224 2SC2362K DET
Q301 2SC2362K B+ REG
Q302 2SA1016K B-REG
Q401 2SA1175 SWITCH
Q402 2SA1175 SWITCH
IC301 PRE AMP
IC401 PROTECTOR
μPC1237HA
M5220L
CN101
CN102
CN103
CN104
CN105
CN106
CN107
CN201
CN202
CN203
CN204
CN205
CN206
CN301
CN302
CN303
CN304
CN305
CN306
CN307
CN309
CN310
CN311
CN312
CN401
CN402
CN404
CN407
CN701
CN702
CN703
CN751
CN752
CN753
CN801
CN802
D101 RD6.8 ESB2
D201 RD6.8 ESB2
D301 RD22ESB2
D304 RD22 ESB2
D401,402 1SS133
D403 RD6.8ESB2
D701 TLR124
D751 TLR124
RV701 50k LEVEL
RV751 50k LEVEL
S801 STEREO MONO
S801 OPERATION
S301
S302
S351
S352
LEVEL (INPUT 1)
LEVEL (INPUT 2)
BAL/UNBAL (INPUT 1)
BAL UNBAL
RY401
TH101
TH201
TP101
TP102
TP201
TP202
RB301 33k X8
RB302 33k X8
RB351 33k X 8
RB352 33k X 8
+VCC
-VCC
GND
B+
B-
CLIP-L
CLIP-R
PRT L
PRT R
L OUT
R OUT
CLIP
L401
L402



• **IC Block Diagrams**

IC401 μPC1237HA



Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- : nonflammable resistor.
- : fusible resistor.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- **B+** : B + Line.
- **B−** : B − Line.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (10 MΩ/V).
- Signal path.
  ⇨ [1] : CH1
  ⇨ [2] : CH2

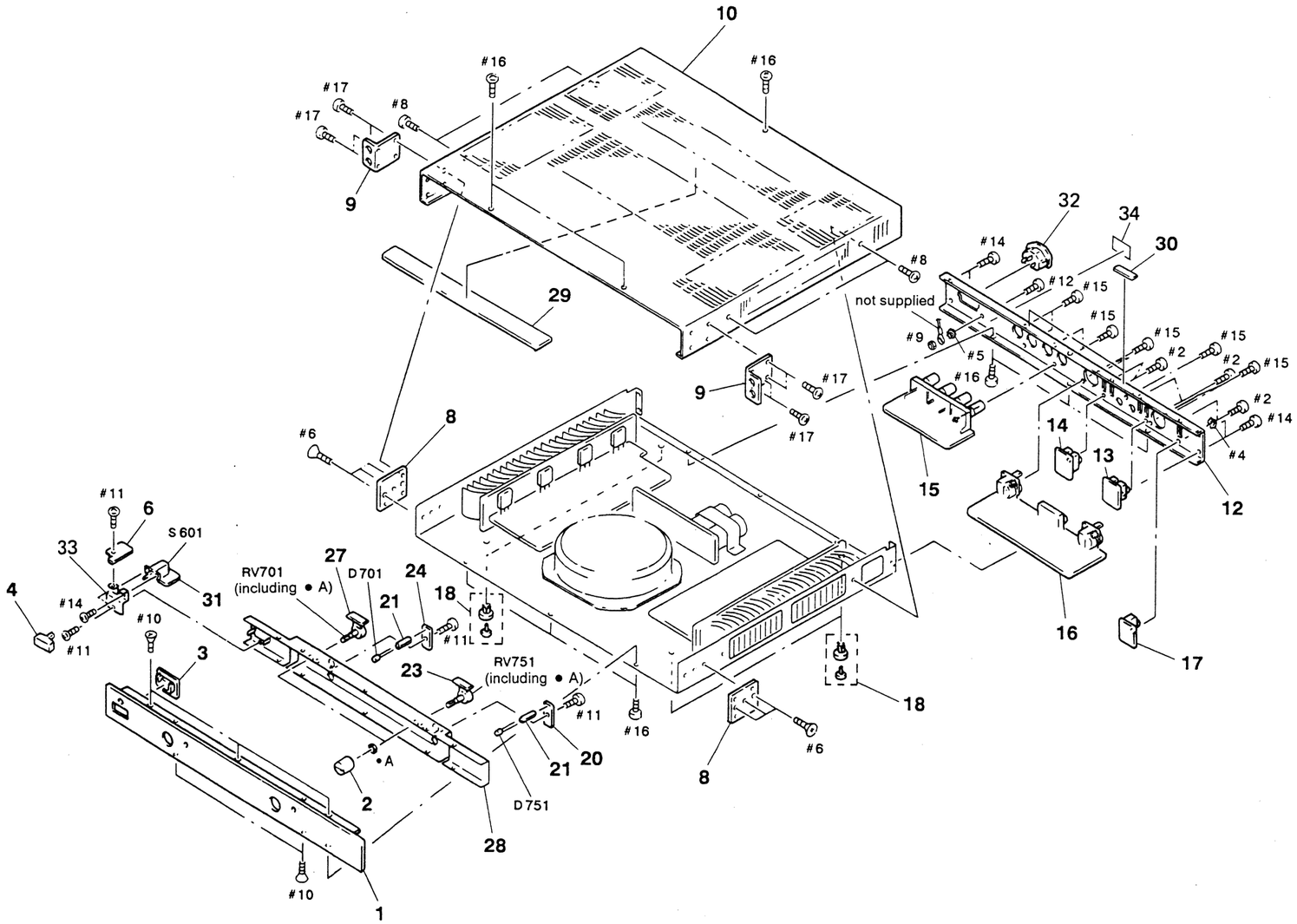
SECTION 4
EXPLODED VIEWS

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts Color ↑ Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

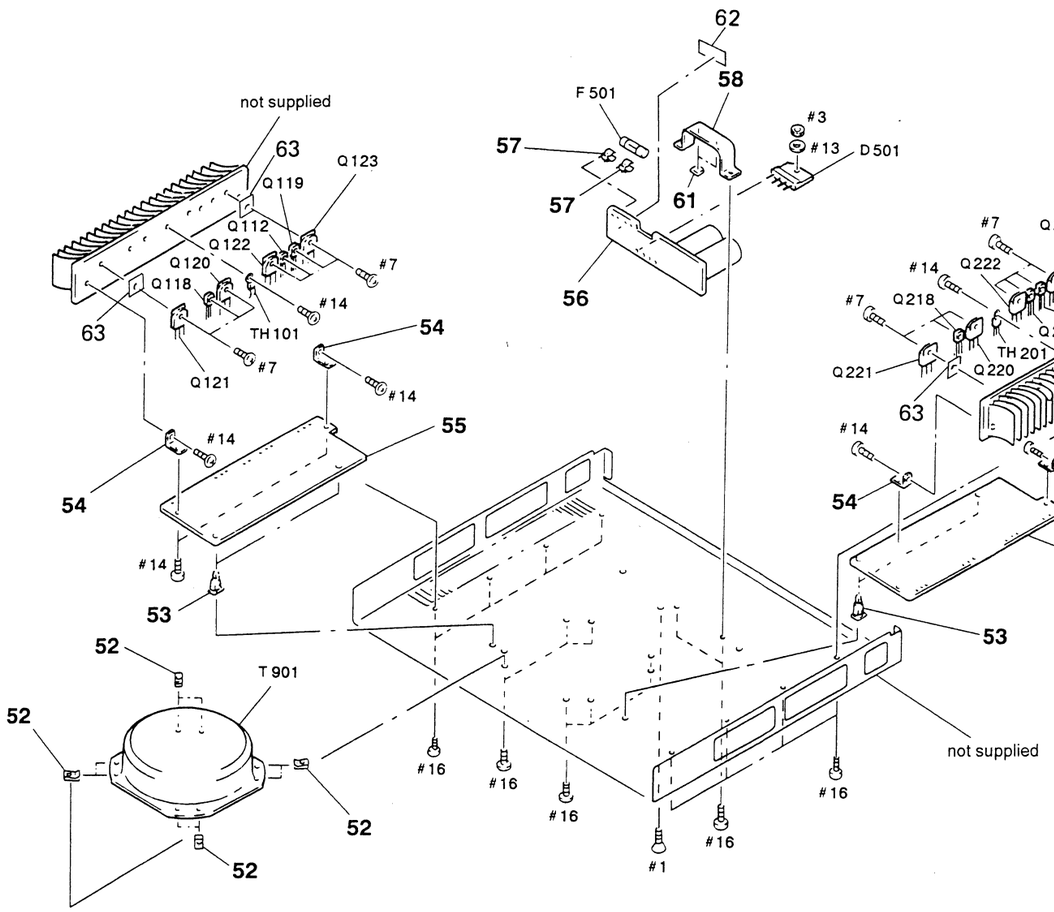
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

(1) FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	2-338-776-01	PANEL, FRONT	
2	2-338-772-01	KNOB	
* 3	2-335-846-01	ESCUTCHEON	
4	2-335-924-01	BUTTON	
* 6	1-649-655-11	LED BOARD	
* 8	2-335-568-01	SPACER, RACK MOUNT	
* 9	2-335-501-01	BRACKET (LARGE), MOUNT	
* 10	2-338-777-01	CASE	
* 12	2-338-686-01	PANEL, BACK	
* 13	1-649-657-11	ATR BOARD	
* 14	1-649-656-11	ATL BOARD	
* 15	1-649-653-11	SP BOARD	
* 16	1-649-651-11	HA BOARD	
* 17	1-649-650-11	BTL BOARD	
18	3-670-155-11	LEG	
* 20	1-649-660-11	CLIP-R BOARD	
21	4-937-336-11	HOLDER, LED	
* 23	1-649-649-11	VRR BOARD	
* 24	1-649-647-11	CLIP-L BOARD	
* 27	1-649-648-11	VRL BOARD	
* 28	2-338-763-01	PANEL, SUB	
* 29	4-916-782-71	DAMPER	
30	9-911-835-XX	SPACER	
* 31	1-649-652-11	PSW BOARD	
32	1-526-954-11	INLET, AC	
33	2-335-845-02	BRACKET, POWER SWITCH	
34	3-703-845-01	LABEL (N) (U/C), MAIN CAUTION	
D701	8-719-812-41	TLR124 (CLIP)	
D751	8-719-812-41	TLR124 (CLIP)	
RV701	1-223-514-11	RES, VAR, CARBON 50K (LEVEL)	
RV751	1-223-514-11	RES, VAR, CARBON 50K (LEVEL)	
⚠S601	1-554-920-11	SWITCH, PUSH (AC POWER) (1 KEY)	

(2) CHASISS SECTION



Ref. No.	Part No.	Description	Remark
52	2-338-744-01	NUT, SPEET, U TYPE	
* 53	2-338-741-01	HOLDER, PCB	
* 54	2-335-567-01	BRACKET, L	
* 55	A-4588-638-A	MOUNTED PCB, PA-L BOARD, COMPLETE	
* 56	1-649-654-11	POW BOARD	
57	1-533-183-11	HOLDER, FUSE	
* 58	2-335-498-01	BRACKET, CAPACITOR	
* 59	A-4588-639-A	MOUNTED PCB, PA-R BOARD, COMPLETE	
61	9-911-837-XX	SPACER (B)	
* 62	2-338-789-01	LABEL, FUSE RATING (AEP)	
63	4-879-937-00	SHEET, MICA	
⚠D501	8-719-033-58	DIODE RBV-1506	
⚠F501	1-532-747-11	FUSE, GLASS TUBE (5A/125V) (120V AREA)	
⚠F501	1-576-228-41	FUSE (H. B. C.) (T2AH/250V) (220V～240V AREA)	
Q112	8-729-203-45	TRANSISTOR 2SC3423-O	
Q118	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q119	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q120	8-729-304-33	TRANSISTOR 2SC3855-Y	
Q121	8-729-304-33	TRANSISTOR 2SC3855-Y	
Q122	8-729-304-30	TRANSISTOR 2SA1491-Y	
Q123	8-729-304-30	TRANSISTOR 2SA1491-Y	
Q212	8-729-203-45	TRANSISTOR 2SC3423-O	
Q218	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q219	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q220	8-729-304-33	TRANSISTOR 2SC3855-Y	
Q221	8-729-304-33	TRANSISTOR 2SC3855-Y	
Q222	8-729-304-30	TRANSISTOR 2SA1491-Y	
Q223	8-729-304-30	TRANSISTOR 2SA1491-Y	
⚠T901	1-423-999-11	TRANSFORMER, POWER (220V～240V AREA)	
⚠T901	1-426-615-11	TRANSFORMER, POWER (120V AREA)	
TH101	1-809-664-31	THERMISTOR, POSITIVE	
TH201	1-809-664-31	THERMISTOR, POSITIVE	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 5
ELECTRICAL PARTS LIST

ATL ATR BTL
CLIP-L CLIP-R HA

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark
*	1-649-656-11	ATL BOARD	
		*********	
		< SWITCH >	
S301	1-571-083-11	SWITCH, SLIDE (BAL/UNBAL(INPUT 1))	
S302	1-571-083-11	SWITCH, SLIDE (LEVEL(INPUT 1))	
**********			
*	1-649-657-11	ATR BOARD	
		*********	
		< SWITCH >	
S351	1-571-083-11	SWITCH, SLIDE (BAL/UNBAL(INPUT 2))	
S352	1-571-083-11	SWITCH, SLIDE (LEVEL(INPUT 2))	
**********			
*	1-649-650-11	BTL BOARD	
		*********	
		< SWITCH >	
S801	1-571-083-11	SWITCH, SLIDE (OPERATION)	
**********			
*	1-649-647-11	CLIP-L BOARD	
		**********	
	4-937-336-11	HOLDER, LED	
		< DIODE >	
D701	8-719-812-41	TLR124 (CLIP)	
**********			
*	1-649-660-11	CLIP-R BOARD	
		**********	
	4-937-336-11	HOLDER, LED	
		< DIODE >	
D751	8-719-812-41	TLR124 (CLIP)	
**********			

Ref. No.	Part No.	Description			Remark
*	1-649-651-11	HA BOARD			
		********			
		< CAPACITOR >			
C301	1-107-085-00	MICA	100PF	5%	50V
C302	1-107-202-00	MICA	10PF	5%	500V
C303	1-107-202-00	MICA	10PF	5%	500V
C304	1-126-059-11	ELECT	10uF	20%	50V
C305	1-126-059-11	ELECT	10uF	20%	50V
C306	1-126-059-11	ELECT	10uF	20%	50V
C307	1-126-052-11	ELECT	100uF	20%	50V
C308	1-126-052-11	ELECT	100uF	20%	50V
C351	1-107-085-00	MICA	100PF	5%	50V
C352	1-107-202-00	MICA	10PF	5%	500V
C353	1-107-202-00	MICA	10PF	5%	500V
C356	1-126-059-11	ELECT	10uF	20%	50V
		< CONNECTOR >			
CN301	1-580-060-11	RECEPTACLE, CONNECTOR 3P (INPUT 1(MONO))			
CN302	1-580-060-11	RECEPTACLE, CONNECTOR 3P (INPUT 2)			
CN303	1-563-523-21	JACK, PIN 2P (INPUT 1(MONO)/INPUT 2)			
CN305	1-564-506-11	PLUG, CONNECTOR 3P			
CN307	1-564-506-11	PLUG, CONNECTOR 3P			
CN309	1-564-511-11	PLUG, CONNECTOR 8P			
CN310	1-564-511-11	PLUG, CONNECTOR 8P			
		< DIODE >			
D303	8-719-110-57	DIODE RD22ES-B2			
D304	8-719-110-57	DIODE RD22ES-B2			
		< IC >			
IC301	8-759-602-19	IC M5220L			
		< TRANSISTOR >			
Q301	8-729-800-32	TRANSISTOR 2SC2362K-G			
Q302	8-729-820-50	TRANSISTOR 2SA1016KFG			

HA LED PA-L

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R301	1-215-872-11	METAL OXIDE	3.3K	5% 1W	F
R302	1-215-872-11	METAL OXIDE	3.3K	5% 1W	F
R303	1-249-414-11	CARBON	560	5% 1/4W	F
R304	1-249-414-11	CARBON	560	5% 1/4W	F
		< COMPOSITION CIRCUIT BLOCK >			
RB301	1-235-730-11	RES, ENCAPSULATED CERMET			
RB302	1-235-730-11	RES, ENCAPSULATED CERMET			
RB351	1-235-730-11	RES, ENCAPSULATED CERMET			
RB352	1-235-730-11	RES, ENCAPSULATED CERMET			
**********					
*	1-649-655-11	LED BOARD			
		*********			
		< DIODE >			
D702	8-719-820-51	TLSG126 (POWER)			
**********					
*	A-4588-638-A	PA-L BOARD, COMPLETE			
		**********			
*	1-560-242-41	BUS BAR 11P			
		< CAPACITOR >			
C101	1-124-915-11	ELECT	10uF	20%	63V
C103	1-126-022-11	ELECT	47uF	20%	25V
C104	1-107-206-00	MICA	15PF	5%	500V
C105	1-107-206-00	MICA	15PF	5%	500V
C106	1-126-022-11	ELECT	47uF	20%	25V
C107	1-136-165-00	FILM	0.1uF	5%	50V
C108	1-136-165-00	FILM	0.1uF	5%	50V
C110	1-107-041-00	MICA	1.8PF		500V
C111	1-126-022-11	ELECT	47uF	20%	25V
C114	1-126-059-11	ELECT	10uF	20%	50V
		< CONNECTOR >			
CN101	1-564-505-11	PLUG, CONNECTOR 2P			
CN103	1-564-505-11	PLUG, CONNECTOR 2P			
* CN104	1-564-507-11	PLUG, CONNECTOR 4P			
* CN105	1-564-104-00	PIN, CONNECTOR (B3P-VH) 3P			
CN106	1-535-472-00	TAB, FASTEN			
CN107	1-564-505-11	PLUG, CONNECTOR 2P			
		< DIODE >			
D101	8-719-109-97	DIODE	RD6.8ES-B2		
D102	8-719-107-94	DIODE	1SS202-1		
D103	8-719-107-94	DIODE	1SS202-1		

Ref. No.	Part No.	Description			Remark
D104	8-719-107-94	DIODE	1SS202-1		
D105	8-719-107-94	DIODE	1SS202-1		
D106	8-719-107-94	DIODE	1SS202-1		
D107	8-719-107-94	DIODE	1SS202-1		
D108	8-719-107-94	DIODE	1SS202-1		
		< TRANSISTOR >			
Q101	8-729-119-76	TRANSISTOR	2SA1175-HFE		
Q102	8-729-119-76	TRANSISTOR	2SA1175-HFE		
Q103	8-729-119-76	TRANSISTOR	2SA1175-HFE		
Q104	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q105	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q106	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q107	8-729-801-46	TRANSISTOR	2SC3064		
Q108	8-729-803-37	TRANSISTOR	2SA1237		
Q109	8-729-199-22	TRANSISTOR	2SA992-FA		
Q110	8-729-184-52	TRANSISTOR	2SC1845-FA		
Q111	8-729-820-50	TRANSISTOR	2SA1016KFG		
Q113	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q114	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q115	8-729-119-76	TRANSISTOR	2SA1175-HFE		
Q116	8-729-141-05	TRANSISTOR	2SC2682-QPE		
Q117	8-729-141-06	TRANSISTOR	2SA1142-QPE		
Q124	8-729-800-32	TRANSISTOR	2SC2362K-G		
		< RESISTOR >			
R101	1-249-422-11	CARBON	2.7K	5% 1/4W	F
R102	1-249-441-11	CARBON	100K	5% 1/4W	
R103	1-215-433-00	METAL	3.3K	1% 1/6W	
R104	1-215-433-00	METAL	3.3K	1% 1/6W	
R105	1-247-724-81	CARBON	8.2K	5% 1/4W	F
R106	1-247-724-81	CARBON	8.2K	5% 1/4W	F
R107	1-215-433-00	METAL	3.3K	1% 1/6W	
R108	1-215-433-00	METAL	3.3K	1% 1/6W	
R109	1-215-453-00	METAL	22K	1% 1/6W	
R110	1-249-429-11	CARBON	10K	5% 1/4W	
R111	1-215-423-00	METAL	1.2K	1% 1/6W	
R112	1-215-423-00	METAL	1.2K	1% 1/6W	
R113	1-215-423-00	METAL	1.2K	1% 1/6W	
R114	1-215-423-00	METAL	1.2K	1% 1/6W	
⚠R115	1-212-881-11	FUSIBLE	100	5% 1/4W	F
⚠R116	1-212-881-11	FUSIBLE	100	5% 1/4W	F
R117	1-215-473-00	METAL	150K	1% 1/6W	
R118	1-215-440-00	METAL	6.2K	1% 1/6W	
R119	1-215-473-00	METAL	150K	1% 1/6W	
R120	1-215-440-00	METAL	6.2K	1% 1/6W	
R121	1-249-414-11	CARBON	560	5% 1/4W	F
R122	1-249-421-11	CARBON	2.2K	5% 1/4W	F

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
R123	1-249-414-11	CARBON	560	5%	1/4W	F
R124	1-249-437-11	CARBON	47K	5%	1/4W	
R125	1-249-437-11	CARBON	47K	5%	1/4W	
R126	1-249-414-11	CARBON	560	5%	1/4W	F
R127	1-249-414-11	CARBON	560	5%	1/4W	F
⚠R128	1-212-897-00	FUSIBLE	470	5%	1/4W	F
⚠R129	1-212-869-00	FUSIBLE	33	5%	1/4W	F
⚠R130	1-212-869-00	FUSIBLE	33	5%	1/4W	F
⚠R131	1-212-865-00	FUSIBLE	22	5%	1/4W	F
⚠R132	1-212-865-00	FUSIBLE	22	5%	1/4W	F
⚠R133	1-212-849-00	FUSIBLE	4.7	5%	1/4W	F
⚠R134	1-212-849-00	FUSIBLE	4.7	5%	1/4W	F
R135	1-249-417-11	CARBON	1K	5%	1/4W	F
R136	1-249-417-11	CARBON	1K	5%	1/4W	F
R137	1-217-151-00	RES, METAL PLATE			0.22	
R138	1-217-151-00	RES, METAL PLATE			0.22	
R139	1-217-151-00	RES, METAL PLATE			0.22	
R140	1-217-151-00	RES, METAL PLATE			0.22	
R141	1-249-417-11	CARBON	1K	5%	1/4W	F
R142	1-249-417-11	CARBON	1K	5%	1/4W	F
R143	1-249-419-11	CARBON	1.5K	5%	1/4W	F
R144	1-249-419-11	CARBON	1.5K	5%	1/4W	F
R145	1-249-431-11	CARBON	15K	5%	1/4W	
R146	1-249-437-11	CARBON	47K	5%	1/4W	
⚠R147	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R148	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R149	1-247-807-31	CARBON	100	5%	1/4W	F
⚠R150	1-247-807-31	CARBON	100	5%	1/4W	F
R152	1-247-885-00	CARBON	180K	5%	1/4W	
		< VARIABLE RESISTOR >				
RV101	1-226-770-11	RES, ADJ, METAL GLAZE 470				
RV102	1-226-774-00	RES, ADJ, METAL 47K				
		< THERMISTOR >				
TH101	1-809-664-31	THERMISTOR, POSITIVE				
		< TEST PIN >				
* TP101	1-564-187-00	PIN, CONNECTOR				
* TP102	1-564-187-00	PIN, CONNECTOR				

****

Ref. No.	Part No.	Description			Remark
*	A-4588-639-A	PA-R BOARD, COMPLETE			
		**********			
*	1-560-242-41	BUS BAR 11P			
		< CAPACITOR >			
C201	1-124-915-11	ELECT	10uF	20%	63V
C203	1-126-022-11	ELECT	47uF	20%	25V
C204	1-107-206-00	MICA	15PF	5%	500V
C205	1-107-206-00	MICA	15PF	5%	500V
C206	1-126-022-11	ELECT	47uF	20%	25V
C207	1-136-165-00	FILM	0.1uF	5%	50V
C208	1-136-165-00	FILM	0.1uF	5%	50V
C210	1-107-041-00	MICA	1.8PF		500V
C211	1-126-022-11	ELECT	47uF	20%	25V
C213	1-126-059-11	ELECT	10uF	20%	50V
C214	1-126-022-11	ELECT	47uF	20%	25V
		< CONNECTOR >			
CN201	1-564-505-11	PLUG, CONNECTOR 2P			
CN203	1-564-506-11	PLUG, CONNECTOR 3P			
* CN204	1-564-104-00	PIN, CONNECTOR (B3P-VH) 3P			
CN205	1-535-472-00	TAB, FASTEN			
CN206	1-564-505-11	PLUG, CONNECTOR 2P			
		< DIODE >			
D201	8-719-109-97	DIODE	RD6.8ES-B2		
D202	8-719-107-94	DIODE	1SS202-1		
D203	8-719-107-94	DIODE	1SS202-1		
D204	8-719-107-94	DIODE	1SS202-1		
D205	8-719-107-94	DIODE	1SS202-1		
D206	8-719-107-94	DIODE	1SS202-1		
D207	8-719-107-94	DIODE	1SS202-1		
D208	8-719-107-94	DIODE	1SS202-1		
		< TRANSISTOR >			
Q201	8-729-119-76	TRANSISTOR	2SA1175-HFE		
Q202	8-729-119-76	TRANSISTOR	2SA1175-HFE		
Q203	8-729-119-76	TRANSISTOR	2SA1175-HFE		
Q204	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q205	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q206	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q207	8-729-801-46	TRANSISTOR	2SC3064		
Q208	8-729-803-37	TRANSISTOR	2SA1237		
Q209	8-729-199-22	TRANSISTOR	2SA992-FA		
Q210	8-729-184-52	TRANSISTOR	2SC1845-FA		
Q211	8-729-820-50	TRANSISTOR	2SA1016KFG		
Q213	8-729-119-78	TRANSISTOR	2SC403SP-51		
Q214	8-729-119-78	TRANSISTOR	2SC403SP-51		

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

PA-R **POW**

Ref. No.	Part No.	Description				Remark
Q215	8-729-119-76	TRANSISTOR	2SA1175-HFE			
Q216	8-729-141-05	TRANSISTOR	2SC2682-QPE			
Q217	8-729-141-06	TRANSISTOR	2SA1142-QPE			
Q224	8-729-800-32	TRANSISTOR	2SC2362K-G			
		< RESISTOR >				
R201	1-249-422-11	CARBON	2.7K	5%	1/4W	F
R202	1-249-441-11	CARBON	100K	5%	1/4W	
R203	1-215-433-00	METAL	3.3K	1%	1/6W	
R204	1-215-433-00	METAL	3.3K	1%	1/6W	
R205	1-247-724-81	CARBON	8.2K	5%	1/4W	F
R206	1-247-724-81	CARBON	8.2K	5%	1/4W	F
R207	1-215-433-00	METAL	3.3K	1%	1/6W	
R208	1-215-433-00	METAL	3.3K	1%	1/6W	
R209	1-215-453-00	METAL	22K	1%	1/6W	
R210	1-249-429-11	CARBON	10K	5%	1/4W	
R211	1-215-423-00	METAL	1.2K	1%	1/6W	
R212	1-215-423-00	METAL	1.2K	1%	1/6W	
R213	1-215-423-00	METAL	1.2K	1%	1/6W	
R214	1-215-423-00	METAL	1.2K	1%	1/6W	
⚠R215	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R216	1-212-881-11	FUSIBLE	100	5%	1/4W	F
R217	1-215-473-00	METAL	150K	1%	1/6W	
R218	1-215-440-00	METAL	6.2K	1%	1/6W	
R220	1-215-440-00	METAL	6.2K	1%	1/6W	
R221	1-249-414-11	CARBON	560	5%	1/4W	F
R222	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R223	1-249-414-11	CARBON	560	5%	1/4W	F
R224	1-249-437-11	CARBON	47K	5%	1/4W	
R225	1-249-437-11	CARBON	47K	5%	1/4W	
R226	1-249-414-11	CARBON	560	5%	1/4W	F
R227	1-249-414-11	CARBON	560	5%	1/4W	F
⚠R228	1-212-897-00	FUSIBLE	470	5%	1/4W	F
⚠R229	1-212-869-00	FUSIBLE	33	5%	1/4W	F
⚠R230	1-212-869-00	FUSIBLE	33	5%	1/4W	F
⚠R231	1-212-865-00	FUSIBLE	22	5%	1/4W	F
⚠R232	1-212-865-00	FUSIBLE	22	5%	1/4W	F
⚠R233	1-212-849-00	FUSIBLE	4.7	5%	1/4W	F
⚠R234	1-212-849-00	FUSIBLE	4.7	5%	1/4W	F
R235	1-249-417-11	CARBON	1K	5%	1/4W	F
R236	1-249-417-11	CARBON	1K	5%	1/4W	F
R237	1-217-151-00	RES, METAL PLATE			0.22	
R238	1-217-151-00	RES, METAL PLATE			0.22	
R239	1-217-151-00	RES, METAL PLATE			0.22	
R240	1-217-151-00	RES, METAL PLATE			0.22	
R241	1-249-417-11	CARBON	1K	5%	1/4W	F
R242	1-249-417-11	CARBON	1K	5%	1/4W	F
R243	1-249-419-11	CARBON	1.5K	5%	1/4W	F
R244	1-249-419-11	CARBON	1.5K	5%	1/4W	F
R245	1-249-431-11	CARBON	15K	5%	1/4W	
R246	1-249-437-11	CARBON	47K	5%	1/4W	
⚠R247	1-212-849-00	FUSIBLE	4.7	5%	1/4W	F
⚠R248	1-247-807-31	CARBON	100	5%	1/4W	F
⚠R249	1-247-807-31	CARBON	100	5%	1/4W	F
R252	1-247-885-00	CARBON	180K	5%	1/4W	
		< VARIABLE RESISTOR >				
RV201	1-226-770-11	RES, ADJ, METAL GLAZE 470				
RV202	1-226-774-00	RES, ADJ, METAL 47K				
		< THERMISTOR >				
TH201	1-809-664-31	THERMISTOR, POSITIVE				
		< TEST PIN >				
* TP201	1-564-187-00	PIN, CONNECTOR				
* TP202	1-564-187-00	PIN, CONNECTOR				
**********						
*	1-649-654-11	POW BOARD				
		*********				
	1-533-183-11	HOLDER, FUSE				
		< CAPACITOR >				
C501	1-107-500-11	ELECT	15000uF	20%	50V	
C502	1-107-500-11	ELECT	15000uF	20%	50V	
C503	1-126-059-11	ELECT	10uF	20%	50V	
C504	1-106-367-00	MYLAR	0.01uF	5%	200V	
		< CONNECTOR >				
* CN501	1-564-321-00	PIN, CONNECTOR 2P				
* CN502	1-564-321-00	PIN, CONNECTOR 2P				
* CN503	1-565-395-11	PIN, CONNECTOR 3P				
* CN504	1-564-104-00	PIN, CONNECTOR (B3P-VH) 3P				
		< DIODE >				
⚠D501	8-719-033-58	DIODE	RBV-1506			
D502	8-719-107-94	DIODE	1SS202-1			
		< FUSE >				
⚠F501	1-532-747-11	FUSE, GLASS TUBE (5A/125V) (120V AREA)				
⚠F501	1-576-228-41	FUSE (H.B.C.) (T2AH/250V) (220V~240V AREA)				
		< RESISTOR >				
R501	1-249-431-11	CARBON	15K	5%	1/4W	
**********						

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

PSW SP VRL VRR

Ref. No.	Part No.	Description			Remark
*	1-649-652-11	PSW BOARD			
		*********			
		< CAPACITOR >			
⚠C601	1-161-744-51	CERAMIC	0.01uF		400V
		< SWITCH >			
⚠S601	1-554-920-11	SWITCH, PUSH (AC POWER) (1 KEY)			
**********					
*	1-649-653-11	SP BOARD			
		********			
		< CAPACITOR >			
C401	1-106-343-00	MYLAR	1000PF	5%	200V
C402	1-126-022-11	ELECT	47uF	20%	25V
C403	1-126-022-11	ELECT	47uF	20%	25V
C404	1-126-059-11	ELECT	10uF	20%	50V
C405	1-126-059-11	ELECT	10uF	20%	50V
C406	1-136-165-00	FILM	0.1uF	5%	50V
C407	1-136-165-00	FILM	0.1uF	5%	50V
C408	1-136-165-00	FILM	0.1uF	5%	50V
C409	1-136-165-00	FILM	0.1uF	5%	50V
		< CONNECTOR >			
CN403	1-564-506-11	PLUG, CONNECTOR 3P			
CN404	1-535-472-00	TAB, FASTEN			
CN405	1-564-320-00	PIN, CONNECTOR (B2P-VH) 2P			
CN406	1-537-314-31	TERMINAL BOARD (SP)			
CN407	1-535-472-00	TAB, FASTEN			
CN408	1-535-472-00	TAB, FASTEN			
		< DIODE >			
D401	8-719-107-94	DIODE 1SS202-1			
D402	8-719-107-94	DIODE 1SS202-1			
D403	8-719-109-97	DIODE RD6.8ES-B2			
		< IC >			
IC401	8-759-111-68	IC UPC1237HA			
		< COIL >			
L401	1-420-872-00	COIL, AIR CORE			
L402	1-420-872-00	COIL, AIR CORE			
		< TRANSISTOR >			
Q401	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q402	8-729-119-76	TRANSISTOR 2SA1175-HFE			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R401	1-249-437-11	CARBON	47K	5%	1/4W
R402	1-249-429-11	CARBON	10K	5%	1/4W
R403	1-247-885-00	CARBON	180K	5%	1/4W
R404	1-247-885-00	CARBON	180K	5%	1/4W
R405	1-249-429-11	CARBON	10K	5%	1/4W
R406	1-247-885-00	CARBON	180K	5%	1/4W
⚠R407	1-216-432-00	METAL OXIDE	820	5%	1W F
⚠R408	1-215-857-11	METAL OXIDE	10	5%	1W F
⚠R409	1-215-857-11	METAL OXIDE	10	5%	1W F
⚠R410	1-215-857-11	METAL OXIDE	10	5%	1W F
⚠R411	1-215-857-11	METAL OXIDE	10	5%	1W F
R412	1-249-422-11	CARBON	2.7K	5%	1/4W F
R413	1-249-429-11	CARBON	10K	5%	1/4W
⚠R414	1-215-872-11	METAL OXIDE	3.3K	5%	1W F
R415	1-249-441-11	CARBON	100K	5%	1/4W
		< RELAY >			
RY401	1-515-765-11	RELAY			
**********					
*	1-649-648-11	VRL BOARD			
		*********			
		< CONNECTOR >			
CN703	1-564-506-11	PLUG, CONNECTOR 3P			
		< VARIABLE RESISTOR >			
RV701	1-223-514-11	RES, VAR, CARBON 50K (LEVEL)			
**********					
*	1-649-649-11	VRR BOARD			
		*********			
		< CONNECTOR >			
CN753	1-564-506-11	PLUG, CONNECTOR 3P			
		< VARIABLE RESISTOR >			
RV751	1-223-514-11	RES, VAR, CARBON 50K (LEVEL)			
**********					

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Ref. No.	Part No.	Description			Remark
*	1-649-652-11	PSW BOARD			
		*********			
		< CAPACITOR >			
⚠C601	1-161-744-51	CERAMIC	0.01uF		400V
		< SWITCH >			
⚠S601	1-554-920-11	SWITCH, PUSH (AC POWER) (1 KEY)			
**********					
*	1-649-653-11	SP BOARD			
		********			
		< CAPACITOR >			
C401	1-106-343-00	MYLAR	1000PF	5%	200V
C402	1-126-022-11	ELECT	47uF	20%	25V
C403	1-126-022-11	ELECT	47uF	20%	25V
C404	1-126-059-11	ELECT	10uF	20%	50V
C405	1-126-059-11	ELECT	10uF	20%	50V
C406	1-136-165-00	FILM	0.1uF	5%	50V
C407	1-136-165-00	FILM	0.1uF	5%	50V
C408	1-136-165-00	FILM	0.1uF	5%	50V
C409	1-136-165-00	FILM	0.1uF	5%	50V
		< CONNECTOR >			
CN403	1-564-506-11	PLUG, CONNECTOR 3P			
CN404	1-535-472-00	TAB, FASTEN			
CN405	1-564-320-00	PIN, CONNECTOR (B2P-VH) 2P			
CN406	1-537-314-31	TERMINAL BOARD (SP)			
CN407	1-535-472-00	TAB, FASTEN			
CN408	1-535-472-00	TAB, FASTEN			
		< DIODE >			
D401	8-719-107-94	DIODE 1SS202-1			
D402	8-719-107-94	DIODE 1SS202-1			
D403	8-719-109-97	DIODE RD6.8ES-B2			
		< IC >			
IC401	8-759-111-68	IC UPC1237HA			
		< COIL >			
L401	1-420-872-00	COIL, AIR CORE			
L402	1-420-872-00	COIL, AIR CORE			
		< TRANSISTOR >			
Q401	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q402	8-729-119-76	TRANSISTOR 2SA1175-HFE			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R401	1-249-437-11	CARBON	47K	5%	1/4W
R402	1-249-429-11	CARBON	10K	5%	1/4W
R403	1-247-885-00	CARBON	180K	5%	1/4W
R404	1-247-885-00	CARBON	180K	5%	1/4W
R405	1-249-429-11	CARBON	10K	5%	1/4W
R406	1-247-885-00	CARBON	180K	5%	1/4W
⚠R407	1-216-432-00	METAL OXIDE	820	5%	1W F
⚠R408	1-215-857-11	METAL OXIDE	10	5%	1W F
⚠R409	1-215-857-11	METAL OXIDE	10	5%	1W F
⚠R410	1-215-857-11	METAL OXIDE	10	5%	1W F
⚠R411	1-215-857-11	METAL OXIDE	10	5%	1W F
R412	1-249-422-11	CARBON	2.7K	5%	1/4W F
R413	1-249-429-11	CARBON	10K	5%	1/4W
⚠R414	1-215-872-11	METAL OXIDE	3.3K	5%	1W F
R415	1-249-441-11	CARBON	100K	5%	1/4W
		< RELAY >			
RY401	1-515-765-11	RELAY			
**********					
*	1-649-648-11	VRL BOARD			
		*********			
		< CONNECTOR >			
CN703	1-564-506-11	PLUG, CONNECTOR 3P			
		< VARIABLE RESISTOR >			
RV701	1-223-514-11	RES, VAR, CARBON 50K (LEVEL)			
**********					
*	1-649-649-11	VRR BOARD			
		*********			
		< CONNECTOR >			
CN753	1-564-506-11	PLUG, CONNECTOR 3P			
		< VARIABLE RESISTOR >			
RV751	1-223-514-11	RES, VAR, CARBON 50K (LEVEL)			
**********					

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Ref. No.	Part No.	Description	Remark

ACCESSORIES & PACKING MATERIALS

1-534-827-14 CORD, POWER (120V AREA)
1-551-631-00 CORD, POWER (220V～240V AREA)
2-335-487-01 CUSHION
2-338-762-11 MANUAL, INSTRUCTION (AEP, E)
2-338-762-21 MANUAL, INSTRUCTION (E)

HARDWARE LIST

#1	7-621-561-39	SCREW +K 2.6X10
#2	7-621-775-10	SCREW +B 2.6X4
#3	7-622-207-05	N 2.6, TYPE 2
#4	7-623-307-01	LW 2.6, TYPE (A)
#5	7-623-423-07	LW 4, TYPE B
#6	7-682-261-09	SCREW +K 4X8
#7	7-682-549-09	SCREW +B 3X10
#8	7-682-560-09	SCREW +B 4X6
#9	7-684-024-04	N 4, TYPE 2
#10	7-685-245-19	SCREW +KTP 3X6 TYPE2 NON-SLIT
#11	7-685-645-79	SCREW +BVTP 3X6 TYPE2 SLIT
#12	7-682-561-09	SCREW +BVTT 4X8 (S)
#13	7-688-002-03	W 2.6, MIDDLE
#14	7-682-547-09	SCREW +BV 3X6, S TIGHT
#15	4-909-982-31	SCREW, TAPPING
#16	2-338-688-01	SCREW, STEP TAPPING
#17	7-682-548-09	SCREW +B 3X8

English
93L0503-1
Printed in Japan
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